

ABSTRACT OF THE DISCLOSURE

A MIMO wireless communication system and wireless communication apparatuses are disclosed that increase the practically usable communication channel capacity in the Shannon channel capacity that determines the ratio of maximum signal transmission speed to frequency. Each wireless communication apparatus includes antenna units that transmit and receive radio frequency signals, and a weight controlling unit that provides weights with respect to the antenna units. The antenna units are formed by adaptive array antenna units that can change the directivity by varying weights with respect to antenna elements. The weight controlling unit includes an eigenvalue calculating unit that calculates the eigenvalues of a matrix HH^* (H being a channel matrix), an inverse calculation unit that calculates such a channel matrix H' as to have all eigenvalues within a predetermined range that includes the average value of the calculated eigenvalues, and a directivity adjusting unit that adjusts the adaptive array antenna directivity so that the current channel matrix H approaches the calculated channel matrix H' .

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